ALGEBRA – MODEL No 1

[Q1] Choose the correct answer:

(1) If $x^2 - y^2 = 24$, $x + y = 8$, then $x - y = $ .....

a) 3   b) 4   c) 18   d) 30

(2) If $(x - y)^0 = 1$, then $x \in$ ....

a) $R - \{5\}$ b) $R - \{-5\}$ c) $\{5\}$ d) R

(3) The solution set of : $x^2 = 4x$ is .... where $x \in Q$

a) $\{4\}$ b) $\{0\}$ c) $\{0, 4\}$ d) ϕ

(4) The probability of sure event = ...

a) 0   b) 1   c) -1 d) $\dfrac{1}{2}$

(5) If $x^3 - a = (x - 4)(x^2 + 4x + 16)$, then $a = $ .....

a) 4   b) 8   c) 16   d) 64

(6) $4^3 + 4^3 + 4^3 + 4^3 = $ ....

a) 4^3 b) 4^4 c) 4^{12} d) 4^{81}

[Q2] Complete each of the following:

1) If : $x^2 + 10x + k$ is perfect square then $k = $ ....

2) If $x^3 y^{-3} = 8$, then $\dfrac{x}{y} = $ ....

3) If $2^y \times 5^y = 100$, then $y = $ ....

4) If : $a - b = 7$, $a^2 + ab + b^2 = 9$, then $3a^3 - 3b^3 = $ ....

5) If $2^x = 3$, then $8^x = $ ....

[Q3] factorize completely each of the following :

① $5x^2 - 25$

② $x^2 - 3x - 28$

③ $8 - x^3$

④ $4x^2 - 12x + 9$

[Q4]

A) Find the perimeter of rectangle its area is $40cm^2$ and its length is 3cm. more than its width?

B) <u>find the value of x in each equation of the following :</u>

$2^{x-5} = 3^{2x-10}$

$(x+1)^5 = 32$

[Q5]

A) find in the simplest form : $\dfrac{4^{x+1} \times 9^{2-x}}{6^{2x}}$, then find the value of the result when x = 1

B) A box contains 30 cards numbered from 1 to 30 . a card is drawn randomly. Calculate the probability of drawing card carrying :

① an odd

② A number divisible by 5

③ A number is perfect square

End of the questions

ALGEBRA — MODEL No 2

[Q1] Choose the correct answer:

(1) If $x - y = 2$, $x + y = 7$, then $x^2 - y^2 = $ ....

a) 9　　　　b) 14　　　　c) 28　　　　d) 98

(2) If : $9x^2 - k\,x + 4$ is perfect square then $k = $ ....

a) 6　　　　b) 12　　　　c) 36　　　　d) 72

(3) If $6^x = 11$, then $6^{x+1} = $ ....

a) 12　　　　b) 22　　　　c) 66　　　　d) 72

(4) The solution set of : $x^2 + 1 = 0$ in R is ....

a) $\{1\}$　　　b) $\{-1\}$　　　c) $\{1, -1\}$　　　d) ϕ

(5) If $(2x + 1)$ is factor of $2x^2 + 3x + 1$, then the other factor is ...

a) $2x - 1$　　　b) $X - 1$　　　c) $X + 1$　　　d) $X + 2$

(6) Sixth of the number $(2^{12} \times 3^{12}) = $ ....

a) 6^2　　　b) 6^4　　　c) 6^{11}　　　d) 6^{23}

[Q2] Complete each of the following:

1) If tossing a fair die once, and observing the number on upper face, then the probability of getting a prime number = ...

2) If $x^4 y^{-4} = 16$, then $\dfrac{x}{y} = $ ....

3) If $2^x = 15$, $2^y = 15$ then $2^{x-y} = $ ....

4) If : $x + y = 8$, $x^3 + y^3 = 24$, then $x^2 - xy + y^2 = \cdots$

5) If the probability that a pupil succeed is 0.4 then the probability of his failure = ...

[Q3] factorize completely each of the following :

① $xy - 5y + 6x - 30$ ② $x^2 + 7x + 6$

③ $x^3 - 125$ ④ $9x^2 - 16$

[Q4]

A) A positive integer , its square is more than its 3 times by 40 , find the number ?

B) If $x + x^{-1} = \sqrt{5}$, then find the value of : $x^2 + x^{-2}$ $x^3 + x^{-3}$

[Q5]

A) If $\dfrac{8^x \times 9^x}{18^x} = 64$, then find the value of 4^{-x}

B) In a football league, the probability of a team to win is 0.7 and the probability of a draw is 0.2 .if the number of matches supposed to be played by that team is 30 matches .

How many matches do you predict the team wins ?

How many matches do you predict the team loses ?

End of the questions

ALGEBRA – MODEL NO 3

[Q1] Choose the correct answer:

(1) $3^x + 3^x + 3^x = \ldots\ldots$

a) 3^{2x} b) 3^{x+1} c) 3^x d) 9^{x+1}

(2) If : $x^2 + k\ x + 36$ is perfect square then $k = \ldots\ldots\ldots$

a) ± 6 b) ± 8 c) ± 12 d) ± 18

(3) If : $x^2 + 14\ x + k$ can be factorize , then $k = \ldots\ldots\ldots$

a) 2   b) 7   c) 14   d) 49

(4) If $2^x = 3$, $3^y = 2$, then $x\ y = \ldots\ldots$

a) 1   b) 2   c) 3   d) 6

(5) The solution set of : $x^2 = 9^0$ in R is $\ldots\ldots$

a) $\{-3, 3\}$ b) $\{1\}$ c) $\{-1\}$ d) $\{1, -1\}$

(6) If $a - b = 3$, $x - y = 5$, then $a(x-y) + b(x-y) = \ldots\ldots$

a) 8   b) 15   c) -8 d) -15

[Q2] Complete each of the following:

1) If chosen a digit from a number 37542 ,then the probability of getting an even number = $\ldots\ldots$

2) If $2^{x-5} = (\sqrt{5} - \sqrt{3})(\sqrt{5} + \sqrt{3})$, then $x^2 = \ldots\ldots$

3) A quarter of the number $(\sqrt{2})^{12} = \ldots$

4) If : $x + y = 3$, $x^2 - y^2 = 12$, then $x - y = \ldots\ldots$

5) The probability of the impossible event = $\ldots\ldots$

[Q3] factorize completely each of the following :

A) $8x^3 + 27$ $2x^2 - 18$

___

B) $x^2 + 7x + 12$ $ab - 3b + 5a - 15$

___

[Q4]

A)   A positive integer , if we add its square to its 3 times the result will be 18 , what is the number ?

___

B) Use factorization to get the value of each of the following easily:

$(0.6)^2 - 1.2 \times 10.6 + (10.6)^2$ 98×102

___

[Q5]

A)   prove that : $\dfrac{27^{x-1} \times 8^x}{(2\sqrt{2})^{2x} \times (3\sqrt{3})^{2x}} = \dfrac{1}{27}$

___

B) A class has 40 students, 30 students of them succeed in math , 24 students of them succeed in science , if one of them is chosen randomly from this class , find the probability that the student :

succeed in math   failure in science

◇◇◇

End of the questions

6

ALGEBRA – MODEL No 4

[Q1] Choose the correct answer:

(1) $3x^0 =$ ...., where $x \neq 0$

a) 0   b) 1   c) 3   d) 3x

(2) If $x^2 - 5xy + 6y^2 = 10$, $x - 2y = 5$,then $x - 3y =$ ..

a) 2   b) 7   c) 14   d) 49

(3) $2^{20} + 2^{21} =$ ....

a) 2×2^{40} b) 2×2^{41} c) 3×2^{20} d) 3×2^{21}

(4) If : $kx^2 + 6x - 27$ can be factorize , then k = ...

a) 6   b) 3   c) 9   d) 5

(5) If x = 5 is solution of $x^2 - 6x + n$, then n= ....

a) 5   b) –5   c) 4   d) –4

(6) $(5^{x+2} - 5^{x+1}) \div 5^x =$ ....

a) 5   b) 10   c) 15   d) 20

[Q2] Complete each of the following:

1) If $k^2 + m^2 = 21$, $mk = 3$, then $(k + m)^2 =$ ....

2) If $(x + 1)$ is factor of $5x^2 - 2x - 7$,then the other factor is ......

3) If $3^x + 3^x + 3^x = 1$, then x = ...

4) If : $kx^2 + 20x + 25$ is perfect square , then k = ...

5) If $x + y = 5$, $a + b = 3$ then $ax + xb + ay + yb =$ ......

[Q3] factorize completely each of the following :

A) $x^3 - 8$ $9x^4 - 36y^4$

_____

B) $2x^2 + 10xy + 2y^2$ $x^2 - y^2 + 5x + 5y$

_____

[Q4]

A) Two real numbers, the difference between them is 2 and the

sum of their squares is 74 . Find the two numbers ?

_____

B) Use factorization to get the value of each of the following

easily: $2 \times (26.18)^2 - 2 \times (23.82)^2$

_____

[Q5]

A) If $3^{x+1} = 81$, $4^{x+y} = 1$, then find the value of x and y ?

_____

B) A numbered cards is selected randomly from a set of similar cards

numbered from 1 to 24 , Find the probability of getting a card

that carries : A multiple of 6   A number is perfect square

_____

End of the questions

ALGEBRA – MODEL No 5

[Q1] Choose the correct answer:

(1) If $x^2 - m = (x - 7)(x + 7)$, then m = ...
a) 7   b) –7   c) 49   d) –49

(2)   1) If : $x^3 + y^3 = 15$, x + y = 3 , then $x^2 - xy + y^2 = ...$
a) 3   b) 5   c) 15   d) 45

(3) If x = 2 is solution of $x^2 - 6x + k$, then k = ...
a) 8   b) – 8   c) 4   d) –4

(4) If $2^x = 3$, $3^y = 16$, then x y = ...
a) 2   b) 4   c) –2   d) –4

(5) If : $x^2 + 7x + n$ can be factorize , then n = ...
a) 8   b) 10   c) 18   d) 49

(6) If : $0.05 \times 0.02 = 10^x$ then x = ...
a) –4   b) 0   c) 2   d) 4

[Q2] Complete each of the following:

1)   If $x^2 + a x + 25$ is perfect square , then a = ...

2)   The S.S : x (x – 3) = 5 x in R is ....

3)   If $2x^2 - 3 x - 35 = (2 x + m)(x - 5)$, then m = ...

4) $(x - 3)^0 = 1$ where x ≠ .....

5)   If $(\frac{1}{2})^x = 5$ then $8^{-x} = $ ....

[Q3] Factorize completely each of the following :

    ① $25x^2 - 49$

    ③ $x^2 - 8x + 12$

    ② $2x^3 + 250$

    ④ $ab + 4b + 5a + 20$

[Q4]

A)   Find the length and width of rectangle its area is 40cm² and its length is 3cm. more than its width?

B) **find the value of x in each equation of the following :**

    ① $(\sqrt{3})^{x-1} = 9$

    ② $5^{x-1} \times 7^{1-x} = 1$

[Q5]

A)   If $\dfrac{49^x \times 25^{2x} \times 3^{4x}}{(\sqrt{49})^{-x} \times (15)^{4x}} = 343$, then find the value of : 6^{2x}

B) in the experiment of composing 2–digit different number from the digits $\{1 , 2 , 3 , 4\}$ .find the sample space then Find the probability of getting :

    ① a number its tens is even

    ② a number both units and tens are even

End of the questions

ALGEBRA – MODEL No 6

[Q1] Choose the correct answer:

(1) If $x^2 + 10x + k$ is perfect square , then k = ...

a) 100   b) 25   c) 20   d) 10

(2) The solution set of : $3x^2 = 3x$ in R is ....

a) $\{3, -1\}$ b) $\{-3, 1\}$ c) $\{0, 1\}$ d) $\{1, 3\}$

(3) If $3^x = 5$, $3^y = 7$, then $3^{x+y} =$ = :.......

a) 12   b) 15   c) 21   d) 35

(4) If : $x^2 + ax - 12$ can be factorize , then a = ...

a) 7   b) 8   c) 4   d) 13

(5) Which of the following is true ($x \in R$)

a) $9^x > 0$ b) $x + 9 > 0$ c) $x^9 > 0$ d) $9x > 0$

(6) If the age of a man now is x year , then his age after 5 years is ....

a) $X + 5$ b) $X - 5$ c) $5x$ d) x

[Q2] Complete each of the following:

1) If : $k^2 + m^2 = 21$, $km = 3$,then k + m = ...

2) If $(x + 1)$ is factor of $5x^2 - 2x - 7$,then the other factor is ......

3) If Sixth of the number ($2^{12} \times 3^{12}$) = 6^k , then k = ...

4) The S.S : $x^3 + 25x = 0$ in R is ....

5) If $3^x + 3^x + 3^x = 1$, then x = ...

[Q3] factorize completely each of the following :

A) ① $x^6 - 7x^3 - 8$ ② $16x^2 - a^2 + 6ax - 9x^2$

_____

B) Use factorization to get the value of each of the following easily:

① $(14.06)^2 - 8.12 \times 14.06 + (4.06)^2$ ② $(998)^2 - 4$

_____

[Q4]

A) Find real number that its twice exceed to its multiplicative inverse by 1 ?

_____

B) find the value of x in each of the following :

① $3^{x-1} = 27$ ② $3^{x-3} = 2^{2x-6}$

_____

[Q5] A) If $\dfrac{8^x \times 3^{2x}}{18^x} = 64$, then find the value of 4^{-x}

_____

B) A box contains 40 cards numbered from 1 to 40 . a card is drawn randomly. Calculate the probability of drawing card carrying :
① An even number
② A number divisible by 5
③ A number is perfect square
④ A prim number less than 18

End of the questions

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ALGEBRA — MODEL No ⑦

[Q1] Choose the correct answer:

(1) If : $x^2 - k\,x + 25$ is perfect square then $k = $ ....

a) 5   b) 25   c) ± 10 d) ± 5

(2) $4^3 + 4^3 + 4^3 + 4^3 = $ ....

a) 4^4 b) $(16)^3$ c) 4^{12} d) 4^{81}

(3) If $x = \dfrac{\sqrt{9}}{\sqrt{3}}$, then $x^{-1} = $ ....

a) $\sqrt{3}$ b) 2   c) $\dfrac{\sqrt{3}}{\sqrt{2}}$ d) $\dfrac{\sqrt{3}}{3}$

(4) If : $k - m = 9$, $k + m = 15$ then $k^2 - m^2 = $ ....

a) 135   b) 9   c) 150   d) $\dfrac{3}{5}$

(5) $2^0 + 2^{-1} - \left(\dfrac{-1}{\sqrt{2}}\right)^2 = $ ....

a) 2   b) 0   c) 1   d) -1

(6) Quarter of $(\sqrt{2})^{12} = $ ....

a) $(\sqrt{2})^3$ b) 2^3 c) 2^4 d) 12

[Q2] Complete each of the following:

1) $x^2(x+1)(x-1) = (\ldots\ldots - \ldots\ldots)(x+1)$

2) $x^2 - 5x + 6 = (\ldots\ldots - 3)(x - \ldots\ldots)$

3) The probability of an impossible event = ...

4) $x^3 + 8 = (\ldots + 2)(x^2 \ldots\ldots + 4)$

5) $\sqrt{2} \times (\sqrt{2})^2 \times (\sqrt{2})^3 = $ .... in the simplest form

[Q3]

A) In a football league, the probability of a team to win is 0.6 and the probability of a draw is 0.3 .if the number of matches supposed to be played by that team is 30 matches .
How many matches do you predict the team loses?

_____

B) The solution set of : $2x^2 - 5x = 3$ in R is ....

_____

[Q4]

A) Find in the simplest form : $\dfrac{2^{2n+1} \times 5^{2n+1}}{10^{2n}}$

_____

B) If : $(9)^{x+3} = 3^{x+5}$, then find the value of x ?

_____

[Q5] Factorize completely each of the following:

① $5x^2 - 3x - 2$ ③ $a^2 - b^2c^4$

② $64x^4 + n^4$ ④ $x^2 - 2xy + y^2 - z^2$

𝓔nd of the questions

ALGEBRA – MODEL No 8

[Q1] Choose the correct answer:

(1) If : $a^2 - b^2 = 16$, $b - a = 2$,then $a + b = $ ....

a) 4   b) – 8   c) 8   d) 2

(2) If : $\sqrt{x + 5} = 3$ then $\sqrt{x} = $ ....

a) 0   b) 2   c) 4   d) 9

(3) The S S of : $x^2 + 4 = 0$ in R is ....

a) $\{-4\}$ b) $\{-2, 2\}$ c) $\{-4, 4\}$ d) ϕ

(4) Sixth of the number ($2^{12} \times 3^{12}$)= ....

a) 6^2 b) 6^{11} c) 6^4 d) 6^{23}

(5) If : $4x^2 + 12x + a$ is perfect square then a = ...

a) 6   b) 16   c) 1   d) 9

(6) If : $4^5 = 5$, then $4^{x-1} = $ ....

a) 1.25   b) 0.125   c) 0.8   d) 0.08

[Q2] Complete each of the following:

1) If : $5^{x+3} = 7^{x+5}$, then x = ...

2) $(5x - 2y)(25x^2 + 10xy + y^2) = $ ....

3) If : $x = (\sqrt{2} + 3)^5$, $y = (\sqrt{2} - 3)^5$, then $xy = $ ......

4) In a mixed school there are 300 pupils , the probability of selecting perfect student is a boy 0.6 , then the number of girls is ....

5) If : $a^2 + 2ab + b^2 = 25$, then $a + b = $ ....

[Q3] factorize completely each of the following :

A) $4a^4 - 9a^2 + 6a - 1$ ② $49x^2 - 25$

___

B) What is the real number which its double exceeds its

multiplicative inverse by 1 ?

___

[Q4]

A) find the solution set in R : $(x - 4)^5 = 32$

___

B) If : $\left(\frac{3}{5}\right)^{x+2} = \frac{125}{27}$ then find the value of x ?

___

[Q5]

A) If : $3^x = 27$, $4^{x+y} = 1$, then fin the value of x and y:

___

B) A box contains 7 black balls , 8 red balls and 5 white balls. If we

draw one ball randomly, find the probability of getting : red ball

blue ball   black or white ball

◇◇◇

End of the questions

ALGEBRA – MODEL No 9

[Q1] Choose the correct answer:

(1) The S.S. in R : $x^2 + 9 = 0$ is ....

a) $\{-3\}$ b) $\{3\}$ c) $\{-3, 3\}$ d) ϕ

(2) If : $a - b = 9$, $a + b = 15$, then $a^2 - b^2 =$ ....

a) 81   b) 135   c) 144   d) 225

(3) If : $x^2 + 14x + b$ is perfect square then $b =$ ....

a) 2   b) 7   c) 14   d) 49

(4) $\dfrac{4 \times 2^{-1}}{3^{-1}} =$ ....

a) 6   b) $\dfrac{1}{3}$ c) $\dfrac{1}{2}$ d) $\dfrac{1}{6}$

(5) If : 4 times a number is 48 , then third of this number is ....

a) 16   b) 12   c) 4   d) 8

(6) If : x is an odd number , then the next odd number is .....

a) $X + 1$ b) $X + 2$ c) $X + 3$ d) $X + 4$

[Q2] Complete each of the following:

1) If : $6^x = 7$, then $6^{x-2} =$ ....

2) The solution set in R : $x^2 = 5x$ is ....

3) Quarter of the number $2^{50} = 2$ ......

4) If : $(x + 5)$ is one factor of : $x^3 + 125$ then the other factor is ...

5) $1 L =$ .... cm^3 .

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[Q3]

A) Simplify : $\dfrac{4^{x+1} \times 9^{x-2}}{6^{2x}}$

B) Find the positive real number , if we add its twice to its square the result will be 35 ?

[Q4]

A) Factorize : $8y^3 + 1$ $\qquad$ $x^2 - 10xy + 25y^2 - 36$

B) If : $8^{4x-1} = 32$, then find the value of x ?

[Q5]

A) Factorize : $4x^4 + 1$ $\qquad$ $3x^2 + 7x + 2$

B) In a football league, the probability of a team to win is 0.6 and the probability of a draw is 0.3 .If the number of matches supposed to be played by that team is 30 matches .

How many matches do you predict the team draw ?

How many matches do you predict the team loss ?

End of the questions

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ALGEBRA – MODEL No 10

[Q1] Choose the correct answer:

(1) If : $x^3 + 27 = (x + 3)(x^2 + k + 9)$, then $k = $ ....

a) $-6x$ b) $-3x$ c) $3x$ d) $6x$

(2) If : $x^2 + y^2 = 7$, $xy = 3$, $(x - y)^2 = $ ....

a) -1 b) 1 c) ± 1 d) 10

(3) If : $x^3 y^{-3} = 8$, then $\dfrac{y}{x} = $ ....

a) $\dfrac{1}{512}$ b) $\dfrac{1}{8}$ c) $\dfrac{1}{2}$ d) 2

(4) If : $3^x = 5$, then $27^x = $ ....

a) 9 b) 25 c) 125 d) 729

(5) If : $(x - 1)$ is one factor of : $x^2 - 4x + 3$ then the other factor is ...

a) $X + 3$ b) $X - 3$ c) $X + 1$ d) $X - 4$

(6) If : $x^2 + 4x + a$ is perfect square then $a = $ ....

a) 3 b) 4 c) 8 d) 16

[Q2] Complete each of the following:

1) If : $x + y = 7$, $x^2 - y^2 = 35$, $y - x = $ ....

2) The probability of an impossible event = ...

3) If : $2^x = 5$, $2^{-y} = 3$, $2^{x+y} = $ ....

4) complete in the same pattern: $1 , 4 , 9 , 16 , 25 , $ ....

5) If : $(25)^2 - (15)^2 = 10x$, then $x = $ ...

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[Q3]

A) prove that : $\dfrac{(\sqrt{2})^2 \times 2^{1-x} \times 12^{2x-1}}{8^x \times 9^x} = \dfrac{1}{3}$

B) Two consecutive odd numbers there sum is 130 . find the two numbers ?

[Q4]

A) Factorize: ① $x^2 - 7x + 12$ ② $4x^4 + y^4$

B) If : $\dfrac{7^x \times 6^x}{14^2} = 3^{2-m}$, then find the value of $x + m$?

[Q5]

A) Factorize : ① $x^4 - 8x$ ② $ax - ay + x - y$

B) A basket contains balls numbered from 1 to 15 . a ball is drawn randomly. Calculate the probability of drawing ball carrying :

① An even number

② A number divisible by 3

③ A prim number

End of the questions

①

① $X - y = \dfrac{X^2 - y^2}{X+y} = \dfrac{24}{8} = 3$

② $(X-5)^0 = 1$

Then $X \in R - \{0\}$

③ $X^2 - 4X = 0$

$X(X-4) = 0$

$X = 0 \mid X = 4$

$S.S = \{0, 4\}$

④ $P(\text{sure event}) = 1$

⑤ $a = (4)^3 = 64$

⑥ $4^3(1+1+1+1) = 4^3 \times 4^1 = 4^4$

_____

♡ 2

① $K = \dfrac{(100 X^2)}{4(X^2)} = 25$

② $\left(\dfrac{X}{y}\right)^3 = \left(\dfrac{2}{1}\right)^3 \Rightarrow \dfrac{X}{y} = 2$

③ $2^y \times 5^y = 100 = 10^2$

$\therefore y = 2$

④ $3(a^3 - b^3) = 3(a-b)(a^2 + ab + b^2)$

$= 3 \times 7 \times 9 = 189$

⑤ $(8)^X = (2^3)^X = (2^X)^3 = 3^3 = 27$

_____

♡ 3

① $5X^2 - 25 = 5(X^2 - 5)$

$= 5(X - \sqrt{5})(X + \sqrt{5})$

② $X^2 - 3X - 28 = $

$(X-4)(X+7)$

③ $8 - X^3 = (2-X)(4 + 2X + X^2)$

④ $4X^2 - 12X + 9 = (2X - 9)^2$

---

④

Ⓐ Assume $\begin{cases} \text{length} = X + 3 \\ \text{width} = X \end{cases}$

Area = length × width

$40 = X(X+3)$

$\therefore X^2 + 3X - 40 = 0$

$(X + 8)(X - 5) = 0$

$X = -8 \quad\mid\quad X = 5$

Rejected $\quad\mid\quad \therefore$ width $= 5$ cm

$X \quad\mid\quad$ length $= X + 3$

$= 5 + 3 = 8$ cm

$\therefore$ Perimeter $= 2(5+8) = 26$ cm

Ⓑ $2^{X-5} = 3^{2X-10} = 3^{2(X-5)} = 9^{X-5}$

$2 \ne 9$

$\searrow X - 5 = 0 \Rightarrow \boxed{X = 5}$

⊛ $(X+1)^5 = 32 = 2^5$

$X + 1 = 2 \Rightarrow \boxed{X = 1}$

⑤ Ⓐ $\dfrac{4^{X+1} \times 9^{2-X}}{6^{2X}}$

$= \dfrac{(2^2)^{X+1} \times (3^2)^{2-X}}{2^{2X} \times 3^{2X}} = \dfrac{2^{2X+2} \times 3^{4-2X}}{2^{2X} \times 3^{2X}}$

$= 2^{2X+2-2X} \times 3^{4-2X-2X} = 2^2 \times 3^{4-4X}$

$= \boxed{4 \times 3^{4-4X}}$

when $X = 1$

magnitude $= 4(3)^{4-4} = 4(3)^0$

$= 4$

_____

Ⓑ $S = \{1, 2, 3, 4, \text{----}, 30\}$

① $P(A) = \dfrac{15}{30} = \dfrac{1}{2}$

② $P(B) = \dfrac{6}{30} = \dfrac{1}{5}$

③ $P(C) = \dfrac{5}{30} = \dfrac{1}{6}$

$A = \{1, 3, 5, 7, \text{---}, 29\}$

$B = \{5, 10, 15, 20, 25, 30\}$

$C = \{1, 4, 9, 16, 25\}$

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Model ② Algebra

1) $x^2 - y^2 = (x-y)(x+y) = 2 \times 7 = 14$

② $K = \pm 2\sqrt{9x^2}\sqrt{4} = \pm 12x$

∴ $K = 12$

③ $6^{x+1} = 6^x \times 6^1 = 11 \times 6 = 66$

④ $x^2 = -1 \Rightarrow x = \pm\sqrt{-1} \Rightarrow s.s = \phi$

$\notin R$

⑤ $2x^2 + 3x + 1 = (2x+1)(x+1)$

⑥ $\dfrac{2^{12} \times 3^{12}}{6^1} = \dfrac{6^{12}}{6^1} = 6^{11}$

---

②① $A = \{2,3,5\} \Rightarrow P(A) = \dfrac{3}{6} = \dfrac{1}{2}$

② $\left(\dfrac{x}{y}\right)^4 = (2)^4 \Rightarrow \dfrac{x}{y} = 2$

③ $2^{x-y} = \dfrac{2^x}{2^y} = \dfrac{15}{15} = \boxed{1}$

④ $(x^2 - xy + y^2)(x+y) = (x^3 + y^3)$

∴ $x^2 - xy + y^2 = \dfrac{24}{8} = 3$

⑤ $1 - 0.4 = 0.6$

---

③① $y(x-5) + 6(x-5)$

$(x-5)(y+6)$

② $x^2 + 7x + 6 = (x+6)(x+1)$

③ $x^3 - 125 = (x-5)(x^2 + 5x + 25)$

④ $9x^2 - 16 = (3x-4)(3x+4)$

---

④ Ⓐ Assume number $= x$

its square $= x^2$

∴ $x^2 = 3x + 40$

$x^2 - 3x - 40 = 0$

$(x+5)(x-8) = 0$

$x = -5$ | $x = 8$

rejected

∴ number is $\boxed{8}$

---

③ $x + x^{-1} = \sqrt{5} \Rightarrow x + \dfrac{1}{x} = \sqrt{5}$

① $x^2 + x^{-2} = x^2 + \dfrac{1}{x^2}$

∵ $\left[\left(x + \dfrac{1}{x}\right)\right]^2 = \left[\sqrt{5}\right]^2$ بالتربيع

$x^2 + 2 + \dfrac{1}{x^2} = \sqrt{5} \times \sqrt{5}$

∴ $x^2 + \dfrac{1}{x^2} = 5 - 2 = \boxed{3}$

② $x^3 + x^{-3} = \left(x + \dfrac{1}{x}\right)\left(x^2 - 1 + \dfrac{1}{x^2}\right)$

$= \sqrt{5}(3-1) = 2\sqrt{5}$

---

②⑤ Ⓐ)

$\dfrac{8^x \times 9^x}{18^x} = 64$

$\dfrac{2^{3x} \times 9^x}{2^x \times 9^x} = 64 \Rightarrow 2^{3x-x} = 64$

∴ $2^{2x} = 2^6 \Rightarrow 2x = 6$

$x = 3$

∴ $4^{-x} = 4^{-3} = \dfrac{1}{4^3} = \dfrac{1}{64}$

Ⓑ)

Probability of win $= 0.7$

~ draw $= 0.2$

~ loss $= 1 - 0.7 - 0.2 = 0.1$

①∴ number of matches wins

$= 0.7 \times 30 = 21$ matche

②∴ number of matches loss

$= 0.1 \times 30 = 3$ matches #

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Q1

① $3^x(1+1+1) = 3^x \times 3 = 3^{x+1}$

② $K = \pm 2(x)(6) = \pm 12X$

$\boxed{K = \pm 12}$

③ $K = 49 \Rightarrow x^2 + 14X + 49$

$(X+7)(X+7) = (X+7)^2$ ✓

④ $(2^x)^y = 2 \Rightarrow (2)^{xy} = 2^1$

$xy = 1$

⑤ $X^2 = 1 \Rightarrow X = \pm 1 \Rightarrow \{1, -1\}$

⑥ $(x-y)(a+b) = 3 \times 5 = 15$

Q2

① $= P(even) = \dfrac{2}{5}$

② $2^{X-5} = (5-3) = 2^1$

$X - 5 = 1 \Rightarrow X = 6$

③ $\dfrac{(\sqrt{2})^{12}}{4} = \dfrac{(2^{\frac{1}{2}})^{12}}{2^2} = \dfrac{2^6}{2^2} = 2^4 = 16$

④ $X - y = \dfrac{x^2 - y^2}{x+y} = \dfrac{12}{3} = 4$

⑤ Zero

Q3

① $8X^3 + 27$
$= (2X+3)(4X^2 - 6X + 9)$

② $2X^2 - 18 = 2(X^2 - 9)$
$= 2(X-3)(X+3)$

③ $X^2 + 7X + 12 = (X+4)(X+3)$

④ $ab - 3b + 5a - 15$
$b(a-3) + 5(a-3)$
$(a-3)(b+5)$

Q4) $\boxed{A}$ Assume Number $= X$

$X^2 + 3X = 18$

$X^2 + 3X - 18 = 0$

$(X+6)(X-3) = 0$

$X = -6 \quad | \quad X = 3$

rejected $\qquad$ ∴ Number IS $\boxed{3}$

لو جة تقليدية في الشكل العام

B) $(10.6)^2 - 1.2 \times 10.6 + (10.6)^2$

$(10.6)[(10.6) - 1.2 + 10.6]$

$= 10.6 \times 20 = 212$

$98 \times (102) = (100-2)(100+2)$

$= (100)^2 - (2)^2$

$= 10000 - 4 = 9996$

Q5 Ⓐ   ∵ $R.H.S = \dfrac{1}{27}$

∴ $L.H.S)$

$\dfrac{27^{X-1} \times 8^X}{(2\sqrt{2})^{2X} \times (3\sqrt{3})^{2X}}$

$= \dfrac{27^X \times 27^{-1} \times 8^X}{[(2\sqrt{2})^2]^X \times [(3\sqrt{3})^2]^X} = \dfrac{27^X \times 27^{-1} \times 8^X}{8^X \times 27^X}$

$= 27^{-1} = \dfrac{1}{27}$

∴ $L.H.S = R.H.S$

Ⓑ $P(succed\ in\ math) = \dfrac{30}{40} = \dfrac{3}{4}$

$P(failur\ in\ science) = \dfrac{40-24}{40}$

$= \dfrac{16}{40} = \dfrac{2}{5}$

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Ⓢ

model (4) Algebra

Q_1

① $3x^0 = 3 \times 1 = 3$

② $(x-3y) = \dfrac{x^2 - 5xy + 6y^2}{(x-2y)} = \dfrac{10}{5} = 2$

③ $2^{20}(1+2) = 3 \times 2^{20}$

④ $k = 5 \Rightarrow$ By trying

$5x^2 + 6x - 27 = (x+3)(5x-9)$

⑤ $x = 5 \Rightarrow (5)^2 - 6(5) + n = 0$

$n = 5$

⑥ $\dfrac{5^{x+2}}{5^x} - \dfrac{5^{x+1}}{5^x} \overset{!}{=} 5^2 - 5^1$

$= 20$

Q_2 ① $(k+m)^2 = k^2 + 2km + m^2$

$= \boxed{k^2 + m^2 + 2km}$

$= 21 + 2(3) = 27$

② $5x^2 - 2x - 7 = (x+1)(5x-7)$

∴ $(5x-7)$ other factor

③ $3^x(3^1) = 1 \Rightarrow 3^{x+1} = 1 = 3^0$

∴ $x+1 = 0 \Rightarrow x = -1$

④ $kx^2 = \dfrac{400 \, x^2}{4(25)} = 4x^2$

∴ $k = 4$

⑤ $x(a+b) + y(a+b)$

$(a+b)(x+y) = 5 \times 3 = 15$

Q_3 ① $x^3 - 8 = (x-2)(x^2 + 2x + 4)$

② $9x^2 - 36y^4 = (3x - 6y)(3x + 6y)$

③ يوجد تكبير خطأ في السؤال

$2x^2 - 10xy + 8y^2$

$2(x^2 - 5xy + 4y^2)$

$= 2(x-y)(x-4y)$

④ $(x-y)(x+y) + 5(x+y)$

$(x+y)(x-y+5)$

Q_4 [A] Assume Number X

& $x+2$

$x^2 + (x+2)^2 = 74$

$x^2 + x^2 + 4x + 4 - 74 = 0$

$2x^2 + 4x - 70 = 0 \qquad \div 2$

$x^2 + 2x - 35 = 0$

$(x-5)(x+7)$

$x = 5 \qquad | \qquad x = -7$

$x+2 = 7 \qquad | \qquad x+2 = -5$

∴ Two numbers are $5 \, \& +7$

OR $-5 \, \& -7$

[B] $2[(26.18)^2 - (23.82)^2]$

$= 2[(26.18 + 23.82)(26.18 - 23.82)]$

$= 2 \times 50 \times 2.36 = 236$

Q_5 [A] $3^{x+1} = 81 = 3^4$

$x+1 = 4 \Rightarrow x = 3$

& $4^{x+y} = 1 \Rightarrow 4^{3+y} = 1 = 4^0$

$3+y = 0 \Rightarrow y = -3$

[B] $S = \{1, 2, 3, \dots, 24\}$

* $P(A) = \dfrac{4}{24} = \dfrac{1}{6}$

$A = \{6, 12, 18, 24\}$

$B = \{1, 4, 9, 16\}$

$P(B) = \dfrac{4}{24} = \dfrac{1}{6}$

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Q1

1) $X^2 - m = (X-7)(X+7) = X^2 - 49$
$m = 49$

2) $X^3 + y^3 = 15 \Rightarrow X^2 - Xy + y^2 = \frac{15}{3} = 5$

3) $X = 2 \Rightarrow (4 - 6 \times 2 + k = 0) \Rightarrow k = 8$

4) $2^x = 3 \quad \xi \quad 3^y = 16 \Rightarrow (2^x)^y = 16 = 2^4 \Rightarrow Xy = 4$

5) $n = 10 \Rightarrow X^2 + 7X + 10 = (X+2)(X+5)$

6) $\frac{5}{100} \times \frac{2}{100} = 10^x \Rightarrow \frac{10}{10000} = 10^x \Rightarrow (10)^{-3} = 10^x$
$X = -3$ not exist in choise قيم‌ة

Q2

1) $a = \pm 2(X)(5) = \pm 10X$

2) $X^2 - 3X - 5X = 0 \Rightarrow X^2 - 8X = 0$
$X(X-8) = 0 \Rightarrow S.S = \{0, 8\}$ In R

3) $2X^2 - 3X - 35 = 2X^2 - 10X + mX - 5m$
$-3X - 35 = X(-10 + m) - 5m$
$-3X = X(-10+m) \Rightarrow -3 = -10 + m$
$m = 7$
OR $\{-35 = -5m\} \Rightarrow m = 7$
OR By Factorize at first quickly

4) $(X-3)^0 = 1 \Rightarrow X \neq 3$

5) $8^{-x} = \frac{1}{8^x} = (\frac{1}{8})^x = (\frac{1}{2})^{3x}$
$= [(\frac{1}{2})^x]^3 = 5^3 = 125$

Q3

1) $25X^2 - 49 = (5X - 7)(5X + 7)$

2) $2X^3 + 250 = 2(X^3 + 125)$
$= 2(X+5)(X^2 - 5X + 25)$

3) $X^2 - 8X + 12 = (X - 2)(X - 6)$

4) $ab + 4b + 5a + 20$
$b(a+4) + 5(a+4)$
$(a+4)(b+5)$

Q4

A) Assume width X, length $= X+3$
$(X)(X+3) = 40$
$X^2 + 3X - 40 = 0 \Rightarrow (X - 5)(X + 8) = 0$

$X = 5$ | $X = -8$ rejected
$X + 3 = 8$

∴ width $= X = 5$ cm
length $= X + 3 = 8$ cm

B) 1) $(\sqrt{3})^{X-1} = 9 = 3^2 = (\sqrt{3})^4$
∴ $X - 1 = 4 \Rightarrow X = 5$

2) $5^{X-1} \times 7^{1-X} = 1$
$5^{X-1} \times (\frac{1}{7})^{X-1} = 1 \Rightarrow (5 \times 7)^{X-1} = 1$
$35^{X-1} = 35^0 \Rightarrow X - 1 = 0 \Rightarrow X = 1$

Q5

$\dfrac{49^X \times 25^{2X} \times 3^{4X}}{(\sqrt{49})^{-X} \times (15)^{4X}} = \dfrac{7^{2X} \times 5^{4X} \times 3^{4X}}{7^{-X} \times 3^{4X} \times 5^{4X}}$

$= 7^{2X - (-X)} = 7^{3X}$

$= 343 = 7^3$

∴ $3X = 3 \Rightarrow X = 1$

∴ $6^{2X} = 6^{(2)} = 36$ ✗

B) $S = \{12, 13, 14, 21, 23, 24, 31, 32, 34, 41, 42, 43\}$ $n(S) = 12$

1) $A = \{21, 41, 42, 23, 43, 24\}$
$P(A) = \frac{6}{12} = \frac{1}{2}$

2) $B = \{42, 24\} \Rightarrow P(B) = \frac{2}{12} = \frac{1}{6}$

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model (6) AlGebra

Q1

① $K = \dfrac{100 x^2}{4 x^2} = 25$

② $3x^2 - 3x = 0 \Rightarrow 3x(x-1) = 0$

$S.S = \{0, 1\}$

③ $3^{x+y} = 3^x \times 3^y = 5 \times 7 = 35$

④ $a = 4 \Rightarrow$ عددٌ حاصل ضربهم 12 والفردُ بينهم $\Rightarrow a$

$\Rightarrow \begin{array}{l} a = 11 \Leftarrow 1 \times 12 \\ a = 4 \Leftarrow 2 \times 6 \\ a = 1 \Leftarrow 3 \times 4 \end{array}$

⑤ $9^x > 0 \begin{cases} 9^0 = 1 > 0 \\ 9^{-1} = \frac{1}{9} > 0 \\ 9^1 = 9 > 0 \end{cases}$

$x \in R$

⑥ $x + 5$

Q2

① $(k+m)^2 = k^2 + 2km + m^2 = 21 + 2 \times 3$
$= 27$

$\therefore k + m = \pm\sqrt{27} = \pm 3\sqrt{3}$

② $5x^2 - 2x - 7 = (x+1)(5x-7)$

③ $\dfrac{2^{12} \times 3^{12}}{6} = 6^k \Rightarrow \dfrac{6^{12}}{6^1} = 6^k$

$\therefore 6^{11} = 6^k \Rightarrow k = 11$

④ $x(x^2 + 25) = 0 \begin{cases} x = 0 \\ x = \pm\sqrt{-25} \notin R \end{cases}$

$\therefore S.S = \{0\}$

⑤ $3^x (3)^1 = 1 \Rightarrow 3^{x+1} = 1 = 3^0 \Rightarrow x+1 = 0$
$x = -1$

Q3 ① $x^6 - 7x^3 - 8 =$

$(x^3 - 8)(x^3 + 1) = (x-2)(x^2 + 2x + 4)$
$(x+1)(x^2 - x + 1)$

② $16 \cdot x^2 - a^2 + 6ax - 9x^2$

$16x^2 - (a^2 - 6ax + 9x^2)$

$16x^2 - (a - 3x)^2$

$(4x + a - 3x)(4x - a + 3x)$

Q3 ① $(14.06 - 4.06)^2 = (10)^2 = 100$

② $(998)^2 - 4 = (998-2)(998+2)$
$= 1000 \times 996 = 996000$

④ A) Assume number is x

$2x - \dfrac{1}{x} = 1 \Rightarrow \times x$

$2x^2 - x - 1 = 0 \Rightarrow (2x+1)(x-1)$
$x = \dfrac{-1}{2} \mid x = 1$

$\therefore$ The number is 1 or $\dfrac{-1}{2}$

B) ① $3^{x-1} = 27 = 3^3 \Rightarrow x-1 = 3 \Rightarrow x = 4$

② $3^{x-3} = 2^{2x-6} = 2^{2(x-3)} = 4^{x-3}$

$\begin{array}{l} 2 \neq 3 \\ x - 3 = 0 \Rightarrow x = 3 \end{array}$

Q5 ① A) $\dfrac{8^x \times 3^{2x}}{18^x} = 64$

$\dfrac{8^x \times 9^x}{2^x \times 9^x} = 64 \Rightarrow \left(\dfrac{8}{2}\right)^x = 64$

$4^x = 64 \Rightarrow 4^{-x} = \dfrac{1}{64}$

B) $S = \{1, 2, 3, 4, \cdots\cdots, 40\}$

① $A = \{2, 4, 6, 8, 10, \cdots, 40\}$
$P(A) = \dfrac{20}{40} = \dfrac{1}{2}$

② $B = \{5, 10, 15, 20, 25, 30, 35, 40\}$
$P(B) = \dfrac{8}{40} = \dfrac{1}{5}$

③ $C = \{1, 4, 9, 16, 25, 36\}$
$P(C) = \dfrac{6}{40} = \dfrac{3}{20}$

④ $D = \{2, 3, 5, 7, 11, 13, 17\}$
$P(D) = \dfrac{7}{40}$ #

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model ⑦ Al Gebra

Q1

① $k = \pm 2(x)(5) = \pm 10 x$

    $k = \pm 10$

② $4^3(1+1+1+1) = 4^3 \times 4^1 = 4^4$

③ $x^{-1} = \dfrac{\sqrt{3}}{\sqrt{9}} \times \dfrac{\sqrt{9}}{\sqrt{9}} = \dfrac{\sqrt{27}}{9} = \dfrac{3\sqrt{3}}{9} = \dfrac{\sqrt{3}}{3}$

④ $k^2 - m^2 = (k-m)(k+m)$

    $= 9 \times 15 = 135$

⑤ $1 + \dfrac{1}{2} - \left(\dfrac{1}{2}\right) = 1$

⑥ $\dfrac{\sqrt{2}^{12}}{4} = \dfrac{2^6}{2^2} = 2^4$

Q2

① $x^2(x+1)(x-1)$

    $= x^2(x-1)(x+1) = \underline{(x^3 - x^2)}(x+1)$

② $(x-3)(x-2)$

③ Zero

④ $(x+2)(x^2 - 2x + 4)$

⑤ $(\sqrt{2})^6 = 2^3 = 8$

Q3

$P(win) = 0.6$

$P(Draw) = 0.3$

$P(losses) = 1 - 0.6 - 0.3 = 0.1$

number of losses matches =

    $P(Losses) \times All$ number of matches

    $= 0.1 \times 30 = 3$

           matches

③ $2x^2 - 5x - 3 = 0$

    $(2x + 1)(x - 3) = 0$

    $x = \dfrac{-1}{2} \quad | \quad x = 3$

    $S.S = \left\{ 3, \dfrac{-1}{2} \right\}$

Q4 Ⓐ $\dfrac{2^{2n+1} * 5^{2n+1}}{10^{2n}}$

    $= \dfrac{(10)^{2n+1}}{(10)^{2n}}$

    $= (10)^{2n+1-2n} = (10)^1 = 10$

Ⓑ $(9)^{x+3} = 3^{x+5}$

    $(3^2)^{x+3} = 3^{x+5}$

    $3^{2x+6} = 3^{x+5} \implies 3 = 3$

    $\therefore 2x+6 = x+5 \implies x = -1$

Q5

① $5x^2 - 3x - 2 = (x-1)(5x+2)$

② $a^2 - b^2 c^4 = (a - bc^2)(a + bc^2)$

③ $64x^4 + n^4 = (8x^2 + n^2)^2 - 16x^2 n^2$

    $= [8x^2 + n^2 - 4xn][8x^2 + n^2 - 4xn]$

④ $x^2 - 2xy + y^2 - z^2$

    $(x-y)^2 - z^2$

    $(x - y - z)(x - y + z)$

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⑬

model (8) AlGebra

1.
① $a^2 - b^2 = (a-b)(a+b)$
$16 = (-2)(a+b)$
$\therefore (a+b) = \frac{16}{-2} = -8$

② $\sqrt{x+5} = 3$
$x+5 = 9 \Rightarrow x = 4 \Rightarrow \sqrt{x} = 2$

③ $x^2 = -4 \Rightarrow x = \pm\sqrt{-4} \notin R$
$\therefore S.S = \phi$

④ $\dfrac{2^{12} \times 3^{12}}{6} = \dfrac{6^{12}}{6} = 6^{11}$

⑤ $a = \dfrac{144 x^2}{4(4x^2)} = 9$

⑥ $4^{x-1} = 4^x \ast 4^{-1} = 5 \times \frac{1}{4} = \frac{5}{4} = 1.25$

$\boxed{4^x = 5}$ يوجد تعمم ذلك (الا اعلم)

2.
① $5^{y+3} = 7^{x+3}$ يوجد تقصير في السؤال, نوع النول
$x+3 = 0 \Rightarrow x = -3$

② $125 x^3 - 8y^3$

③ $xy = (\sqrt{2}+3)^5 (\sqrt{2}-3)^5 = (2-9)^5$
$= (-7)^5 = -78125$

④ $(1-0.6) \ast 300 = 120$ girls

⑤ $a^2 + 2ab + b^2 = 25 \Rightarrow (a+b)^2 = 25$
$a+b = \pm 5$

3. ① A) $4a^4 - (9a^2 - 6a + 1)$
$= 4a^4 - (3a-1)^2$
$(2a^2 + 3a - 1)(2a^2 - 3a + 1)$

② $(7x-5)(7x+5)$

B) Assume number is x
$2x - \frac{1}{x} = 1$ $\ast x$
$2x^2 - 1 = x \Rightarrow 2x^2 - x - 1 = 0$
$(2x+1)(x-1)$
$x = \frac{-1}{2} \mid x = 1$

$\therefore$ the number is 1 or $\frac{-1}{2}$

4. $(x-4)^5 = 32 = 2^5$
Power = Power $\Rightarrow$ Base = Base
$x-4 = 2 \Rightarrow x = 6$

③ $\left(\frac{3}{5}\right)^{x+2} = \frac{125}{27} = \left(\frac{5}{3}\right)^3 = \left(\frac{3}{5}\right)^{-3}$
$x+2 = -3 \Rightarrow x = -3 - 2 = -5$

5. A) $3^x = 27 = 3^3$
$x = 3$

$4^{x+y} = 1 \Rightarrow 4^{3+y} = 1 = 4^0$
$\therefore 3+y = 0 \Rightarrow y = -3$

B) $S = \{7 \text{ Black ball}, 8 \text{ red balls}, 5 \text{ white Balls}\}$

number of balls $= 7 + 8 + 5 = 20$ Balls

$P(\text{red ball}) = \frac{8}{20} = \frac{2}{5}$

$P(\text{blue ball}) = \frac{0}{20} = 0$

$P(\text{black or white}) = \frac{12}{20} = \frac{3}{5}$

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⑮

model (g) Algebra

① $x^2 = 9 \Rightarrow S.S = \phi$

② $a^2 - b^2 = (a+b)(a-b)$
$= 9 \times 15 = 135$

③ $b = \dfrac{14 \times 14 x^2}{4 x^2} = 49$

④ $\dfrac{4 \times \frac{1}{2}}{\frac{1}{3}} = \dfrac{4 \times 3}{2} = 6$

⑤ $4x = 48 \Rightarrow x = 12$
$\dfrac{1}{3} x = \dfrac{1}{3} \times 12 = 4$

⑥ odd number is x
the next odd $= \underline{x+2}$

Q2
① $6^{x-2} = 6^x \times 6^{-2}$
$= 7 \times \dfrac{1}{36} = \dfrac{7}{36}$

② $x^2 - 5x = 0$
$x(x-5) = 0$
$S.S = \{0, 5\}$

③ $\dfrac{2^{50}}{2^2} = 2^{\boxed{48}}$

④ $x^3 + 125 = (x+5)(x^2 - 5x + 25)$

⑤ $1 L = 1000 \text{ cm}^3$

hint
$m^3 \xrightarrow{\ \times 10^3\ } L \text{ (dm)}^3 \xrightarrow{\ \times 10^3\ } \text{cm}^3 \text{ (mL)}$

Q3
①
$\dfrac{4^{x+1} \times 9^{x-2}}{6^{2x}} = \dfrac{\dfrac{2^{2x+2}}{2} \times \dfrac{3^{2x-4}}{3}}{2^{2x} \times 3^{2x}}$

$= 2^{2x+2-2x} \times 3^{2x-4-2x} = 2^2 \times 3^{-4}$
$= 4 \times \dfrac{1}{81} = \dfrac{4}{81}$

③ number $= x$
$2x + x^2 = 35$
$x^2 + 2x - 35 = 0$
$(x - 5)(x + 7) = 0$
$x = 5 \mid x = -7$
number is ⑤ | rejected

6④
$8y^3 + 1 = (2y + 1)(4y^2 - 2y + 1)$

$x^2 - 10xy + 25y^2 - 36$
$(x - 5y)^2 - 36 = [x - 5y - 6][x - 5y + 6]$

B $8^{4x-1} = 32 \Rightarrow 2^{12x-3} = 2^5$

Base = Base $\Rightarrow$ Power = Power

$12x - 3 = 5 \Rightarrow 12x = 8$
$x = \dfrac{8}{12} = \dfrac{2}{3}$

Q5 A ① $4x^4 + 1$
$(2x^2 + 1)^2 - 4x^2$
$(2x^2 + 1 - 2x)(2x^2 + 1 + 2x)$

② $3x^2 + 7x + 2$
$(3x + 1)(x + 2)$

B $P(\text{win}) = 0.6$
$P(\text{draw}) = 0.3$
$P(\text{loss}) = 1 - 0.6 - 0.3 = 0.1$

number of matches Draw $= 0.3 \times 30$
$= 9$ matches

$n)_{\text{loss}} = 0.1 \times 30 = 3$ matches

$n)_{\text{win}} = 0.6 \times 30 = 18$ matches

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model (10) AlGebra

Q1) ① $-3X = K$

② $(X-y)^2 = X^2 + y^2 - 2Xy$
$$= 7 - 2(3) = 1$$

③ $\left(\frac{X}{y}\right)^3 = (2)^3 \Rightarrow \frac{X}{y} = 2$
$$\therefore \frac{y}{X} = \frac{1}{2}$$

④ $(27)^X = (3)^{3X} = (3^X)^3 = 5^3$
$$= 125$$

⑤ $X^2 - 4X + 3 = (X-1)(X-3)$

⑥ $a = \frac{16X^2}{4X^2} = 4$

Q2) ① $X^2 - y^2 = (X-y)(X+y)$
$$35 = (X-y) * 7$$
$$X - y = 5 \Rightarrow y - X = -5$$

Belong $y - X = -(X-y) = -5$ ✓

② zero ✓

③ $2^{X+y} = 2^X \times 2^y = 5 \times \frac{1}{3} = \frac{5}{3}$

④ 36, 49

⑤ $(25-15)(25+15) = 10X$
$$10 * 40 = 10X$$
$$X = 40$$

Q3) L.H.S $= \dfrac{2*2^{1-X} * 3^{2X-1} * 2^{4X-2}}{2^{3X} * 3^{2X}}$

$= 2^{1+1-X+4X-2-3X} * 3^{2X-1-2X} = 2^0 * 3^{-1}$
$$= 1 \times \frac{1}{3} = \frac{1}{3}$$

R.H.S $= \frac{1}{3} \Rightarrow \therefore$ L.H.S = R.H.S

(3) First number $= X$, next umber $= X+2$

$X + X + 2 = 130$
$2X = 128 \Rightarrow X = 64$
$\therefore$ First number $= 64$
Second N $= 66$

Q4) ① $X^2 - 7X + 12$
$$(X-3)(X-4)$$

② $4X^4 + y^4$
$$(2X^2 + y^2) - 4X^2y^2$$
$$(2X^2 + y^2 - 2Xy)(2X^2 - y^2 + 2Xy)$$

---

⑬ $\dfrac{7^X \times 6^X}{14^X} = 3^{2-m}$

في صورة قوة واحدة

(14^X) $\left(\frac{7 \times 6}{14}\right)^X = 3^{2-m}$
$$3^X = 3^{2-m}$$
$$X = 2 - m \Rightarrow X + m = 2$$

Q5) ① $X^4 - 8X = X(X^3 - 8)$
$$= X(X-2)(X^2 + 2X + 4)$$

② $aX - ay + X - y$
$$a(X-y) + (X-y)$$
$$(X-y)(a+1)$$

---

⑬ $S = \{1, 2, 3, ----, 15\}$

P(even number) $= \dfrac{7}{15}$

P(number is divisible by 3) $= \dfrac{5}{15} = \dfrac{1}{3}$

P(Prim number) $= \dfrac{6}{15} = \dfrac{2}{5}$

eng. AbdELAZIZ AK

Best wishes

المهندس / عبد العزيز عقل
(دروس)

Model (1)

(1) Complete :

1) If $4x^2 + 12x + m$ is a perfect square then m = ………..

2) If the expression $x^2 + kx + 2$ can be factorized then k = ………

3) If (x-2) is a factor of the expression $x^2 - 7x + 10$ then the other factor is ....

4) If x-y = 2 , $x^2 - y^2 = 16$ then x+y = ……

5) If $(x-y)^2 = 16$, $x^2 + y^2 = 58$ then x y = ……..

(2) Choose the correct answer :

1) If x+y =5 , $x^2 - xy + y^2 = 7$ then x^3+y^3 = …….. (12 , 2 , 1.4 , 35)

2) The S.S. of the equation $x^2 - 4 = 0$ in R is ….. ({4} , -2 , 2 , { 2 , -2 })

3) The probability of appearing an odd number when a regular dice is tossed once is ………. ($\frac{1}{3}$, $\frac{1}{2}$, 0 , 1)

4) $3^3 + 3^3 + 3^3$ = …….. (3^5 , 3^6 , 3^4 , 3^7)

5) If $2^x = 3$ then 4^x = …….. (9 , 6 , 5 , 27)

6) If $5^x = 4$ then 5^{x-1} = …… (1 , $\frac{1}{2}$, $\frac{4}{5}$, 3)

(3) (a) A rectangle its length exceeds its width by 4 cm . and its area is 45 cm^2 find its perimeter

(b) If $\frac{8^x \times 9^x}{18^x} = 16$ find the value of 4^{-x}

(c) If $3^{2x-3} = 27$ find the value of x

(4) Factorize completely :

a) $x^2 - 8x + 15$ b) $x^2 - 49$

c) $2x^4 + 250x$ d) $x^4 + 4$

(5) a) A box has 8 white balls , 6 red balls and 3 green balls . if a ball is drawn randomly find the probability that the drawn ball is :

1) red   2) not green   3) yellow

b) Find the S.S. in R :

     $2x^2 - 5(x-1) = 12$

Model answer of model 1

(1) a) **9**   b) ± 3 c) **(x – 5)**   d) **8**   e) **21**

(2) a) **35**   b) **{2 , -2 }**   c) $\frac{1}{2}$ d) 3^4 e) **9**

(3) a) **Width = x , length = x+4 , area = l × w**

  X(x + 4) = 45   ∴ $x^2 + 4x = 45$ ∴ $x^2 + 4x - 45 = 0$

∴ **(x + 9) (x – 5) = 0**   ∴ **x= 5 (because -9 is refused) .**

W = 5 cm , l = 5+4= 9 cm , perimeter = (9+5) × 2 = 28 cm

b) $\frac{2^{3x} \times 3^{2x}}{2^x \times 3^{2x}} = 2^{2x}$, $16 = 2^4$ ∴ $2^{2x} = 2^4$ ∴ **x= 2** ∴ $4^{-x} = 4^{-2} = \frac{1}{4^2} = \frac{1}{16}$

c) $3^{2x-3} = 3^3$ ∴ **2x-3 = 3**   ∴ **2x = 6** ∴ **x = 3**

(4) a) **(x-3) (x- 5)**   b) **(x-7) (x + 7)**

c) $2x (x^3 + 125) = 2x (x+5) (x^2 - 5x + 25)$

d) $x^4 + 4x^2 - 4x^2 + 4 = (x^4 + 4x^2 + 4) - 4x^2 = (x^2 + 2)^2 - 4x^2 =$

$(x^2 + 2 - 2x) (x^2 + 2 + 2x)$

(5) a) 1) $\frac{6}{17}$ 2) $\frac{14}{17}$ 3) **0**

b) $2x^2 - 5x + 5 = 12$ ∴ $2x^2 - 5x - 7 = 0$ ∴ **(2x – 7) (x +1) = 0**

$x = \frac{7}{2}$ or **x = -1**   ∴ **S.S in R = { -1 , $\frac{7}{2}$ }**

Good Luck☺

Model (2)

(1) Complete :

1) If $x + y = 8$, $x^2 - y^2 = 16$ then $x - y = $ ……..

2) $3(5)^0 = $ …….. **3) If ($2x - 1$) is a factor of the expression $(2x^2 - 3x + 1)$ then the other factor is ………..**

4) If ($\sqrt{2}$)$^x = 2\sqrt{2}$ then the value of x = ………

5) If $l + m = 9$, $l - m = 4$ then the value of the expression : $x l + x m - y l - y m = $ ………..

(2) Choose the correct answer :

1) If $5^x = 13$ then $5^{x+1} = $ ……. (14 , 206 , 70 , 65)

2) $(99)^2 - 1 = $ ………. (98 , 9800 , 8900 , 100)

3) If the probability of success of a student is $\frac{7}{9}$ then the probability of his failure is …….. (0 , 1 , $\frac{2}{9}$, $\frac{7}{9}$)

4) If ($4x^2 + k x + 9$) is a perfect square then k=………

(± 12 , ± 6 , ± 36 , ± 72)

5) If ($x + y$)$^2 = 29$, $x y = 10$ then $x^2 + y^2 = $ …… (19 , 3 , 39 , 9)

6) If $2^x = 3$ then $8^{-x} = $ ….. (27 , -27 , $\frac{1}{27}$, $\frac{-1}{27}$)

(3) a) Factorize completely :

1) $x^2 + 10 x - 24$ **2) $3x^2 - 75 x$** **3) $b^3 + 125 c^3$** **4) $x^4 + 4 y^4$**

b) A card is drawn randomly from a set of cards numbered from 1 to 24 .

find the probability that the drawn card is

1) a multiple of 4   2) a multiple of 6   3) a multiple of both 4 and 6 together   4) a multiple of either 4 or 6

(4) a) Find the S.S. in R :   x (x- 3) = 5x

b) Two positive integers. One of them exceeds the other by 4 and their product is 45 . Find the two numbers

c) If x = 3 and y = $\sqrt{2}$. Find the value of $(\frac{x}{y})^{-3}$ in the simplest form.

(5) a) A factory of ready made clothes produces 7000 pieces of cloth daily . if a random sample of 1000 pieces is taken and by investigating it . it is found that 25 % of them are defective pieces . find the number of the defective pieces in that day

b) If $\frac{49 \times 25^{2n} \times 3^{4n}}{7^{-n} \times 15^{4n}} = 243$. find the value of 6^{2n}

Model (3)

(1) Choose the correct answer :

1) If $(a + b)^2 = 12$, $a^2 + b^2 = 10$. then $a b = …$ (2 , 1 , -1 , 120)

2) If $x – y = 7$ then $x^2 – 2 x y + y^2 = …..$ (14 , 49 , 7 , 21)

3) $(x – 5)^0 = 1$ if $x \in$ ……. (R , R – { 5 } , { 5 } , $\emptyset$)

4) If $(9 x^2 + k x + 1)$ is a perfect square then $k = \pm$ ………

(1 , 3 , 6 , 9)

5) The S . S . of the equation $x^2 – 3x = 0$ in R is ………..

({ 0 , 3 } , { 0 , -3 } , { 0 } , { 3 })

6) If $x^3 – k^3 = (x\text{-}k) (x^2 + 4x + k^2)$ then $k^3 = …….$ (2 , 4 , 8 , 64)

(2) Complete :

1) $(3x -$ ……….. $) ($ ……….. $– 5) = 3x^2 -$ …… $+ 35$

2) $(105)^2 – (95)^2 = 10 \times$ ……..

3) If $(2c – 5) (3c – 2) = 6c^2 + kc + 10$ then $k = $ …………

4) If $a – b = 5$, $a + b = 3$ then $a^2 – b^2 =$ ……….

5) If $cx – dx + cy – dy = 40$, $c – d = 4$ then $x + y =$ ……..

(3) a) If $\dfrac{3^x \times 8^x}{(12)^{x+1}} = \dfrac{1}{3}$ **then find the value of x .**

b) Factorize completely :

1) $x^2 – 7x – 8$ 2) $(x – y)^2 - 25$

3) $27 b^3 – 8 c^3$ 4) $9 x^4 - 25 x^2 + 16 b$

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(4) a) <u>find the S.S in R :</u>

$$x (x – 5) = 14$$

b) A rectangle its length exceeds its width by 6 cm . and its area is 55 cm^2 . find its length and its width

(5) a) In the operation of production of 400 electric lamps . if the number of defective units of them is 24 units .

1) what is the probability of the defective units

2) If the daily production of this factory is 1500 electric lamps . find the number of good units in this day ?

b) If ($\sqrt{\dfrac{2}{3}}$)^x = $\dfrac{9}{4}$. find the value of ($\dfrac{2}{3}$)$^{x+1}$

Model (4)

a) $(309)^2 - 309 \times 209 = $ …… (3900 , 30900 , 3090 , 3009)

b) If 1 is a root of the equation $x^2 - 2x + b = 0$ then b = …….

(zero , 1 , -1 , -3)

c) If $25 x^2 + mx + 4$ is a perfect square trinomial then m = ……

(10 , 100 , 20 , 5)

d) If $a^2 + b^2 = 11$, $ab = 5$ then $a - b = $ ………

(6 , ± 1 , 1 , -1)

e) one fourth of $4^{20} = $ ……. (4^5 , 1^{20} , 4^{19} , 4^{21})

(2) **Complete :**

a) If $x^3 + y^3 = 35$, $x^2 - x y + y^2 = 7$ then $x + y = $ ……..

b) A rectangle its two dimensions are (a + 3) cm , (a – 3) cm . then its area = (…………..) cm^2 .

c) If (x + 4) is a factor of the expression ($x^2 + 9 x + 20$) then the other factor is ………..

d) The S.S of the equation : (x + 3) (3x – 5) = 0 in R is { ……….}

e) The simplest form of the expression $3^0 + (3)^{-1} - (\frac{-1}{\sqrt{3}})^2 = $ ……

(3) a) **Factorize completely :**

1) $x^3 - 3 x^2 + 2 x$

2) $x^4 - 16$

3) $8 x^3 - 27$

4) $x^2 (x^2 - 19 y^2) + 25 y^4$

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b) A box contains 40 cards numbered form 1 to 40 . a card is drawn randomly find the probability that the drawn card carries

1) an even number

2) A number divisible by 3

3) an even number divisible by 3

(4) a) If $(32)^{x-1} = 8^{2x+1}$ find the value of x .

b) two consecutive odd numbers the sum of their squares is 120

find these two numbers .

(5) a) If $a + b = 3$, $x - y = 2$ find the value of the expression

$ax - ay + bx - by$ using factorizing by grouping .

b) Simplify : $\dfrac{(15)^{-2} \times (\sqrt{5})^3 \times (3)^3}{9 \times (\sqrt{5})^{-3}}$

Model (5)

(1) Choose the correct answer :

1) If ($25 b^2 + 40 b + k$) is a perfect square then k = …………　　　　(4 , 8 , 16 , 64)

2) If ($x + y$)$^2 = 25$, $x^2 + y^2 = 13$ then x y = …..　　　　(2 , 6 , -6 , 12)

3) If $3^x = 5$ and $5^y = 9$ then x y = ……….　　　　(45 , 2 , 15 , 14)

4) If the probability of success of a student is $\frac{5}{7}$ then the probability of his failure is

　　　　　　　　　　　　　　　　　　　　　(0 , $\frac{2}{7}$, $\frac{1}{2}$, 1)

5) The S.S. of the equation : $x^2 – 8 x = 0$ in R is ………　　({8} , {0,-8} , {0,8} , { 0 })

6) If $x^3 + y^3 = 91$, $x + y = 13$ then $x^2 – x y + y^2$ = ……　　(104 , 78 , 14 , 7)

(2) Complete:

1) If x = ($5 + 2$)^9 , y = ($5 + 2$)$^{-9}$ then x y = ……………

2) The simplest form of the expression $3^{-2} \times 3^{-3} \div 9^{-3}$ = ………..

3) If (x – 3) is a factor of the expression $x^2 – 8x + 15$ then the other factor is …...

4) (89)^2 – (11)^2 = ………

5) The expression $x^2 + k x + 3$ can be factorized if k = …….. or ……..

(3) (a) Factorize completely :

1) $x^2 – 7 x - 8$　　　　2) (a-b)$^2 – 49$　　　　3) $2x^3 – 250 y^3$　　4) $x^4 + 4y^4$

(b) If l-m = 3 , x + y = 7   then find the value of : (l x – m y + l y – m y)　　using factorization by grouping

(4) (a) Find the S.S. of the equation : x (2x – 1) = 6   in R .

(b) A set of numbered cards from 1 to 20 . if a card is drawn randomly find the probability that the drawn card carries a number 1) multiple of 4　　　　2) divisible by 7　　3) multiple of 4 or divisible by 7

(5) (a) Find the positive integer that is its square is more than its three times by 40

(b) If $a = \sqrt{3}$, $b = \sqrt{2}$ find the value of : $\dfrac{a^3 + b^3}{a+b}$